

REMARKS

The Office Action of October 6, 2004 has been received and carefully reviewed. It is submitted that, by this Communication, all bases of rejection and objection are traversed and overcome. Upon entry of this Communication, claims 6-19 and 30-31 remain in the application; and new claims 32-34 have been added to set forth additional specific embodiments of Applicants' invention. Reconsideration of the claims as revised is respectfully requested.

Claims 6-8 and 13 stand rejected under 35 U.S.C. § 112, first paragraph, because the specification, while enabling for a biomimetic catalytic agent as required by claim 9 and a lipophilic salt as required by claim 14, does not reasonably provide enablement for other biomimetic catalytic agents and lipophilic salts. The Examiner contends that the specification does not enable any person skilled in the art to make and use the invention commensurate in scope with the claims.

Applicants respectfully take issue with the Examiner's assertion regarding the enablement of claims 6-8 and claim 13. The commonality between the structures in claim 9 is the copper(II) metal center of the complex. Applicants respectfully submit that one skilled in the art would be able to look at the structures of claim 9 and predict, without undue experimentation, that any organo-metallic complex containing a copper(II) center (as recited in claim 8) would be able to perform the same chemistry. Further, one skilled in the art would be able to predict that any compound (whether organo-metallic in structure or not) containing copper (II) should also function in the same manner. Without undue experimentation, one skilled in the art could search the literature for other copper(II)-containing complexes that would function substantially the same as those recited in claim 9.

Regarding claim 7, the Examiner's attention is directed to page 10, lines 18-23, of the specification as filed which lists several other metal ions that are capable of reducing one or more of nitrite, nitrate, nitrosothiols, and other nitrogen-containing blood species to nitric oxide. Still further, one skilled in the art knows that metal cations are oxidizing agents. As such, one skilled in the art would be able to suggest, or look up in a chemical catalog, other organometallic complexes containing metal ion centers, that are good

oxidizing agents, that would be able to reduce nitrite or nitrosothiols to nitric oxide as recited in claim 6, in addition to copper(II).

Still further, Applicants define “biomimetic catalytic agent” in the specification as filed at page 3, line 17, as “a species possessing nitrite reductase-like activity, or the ability to reduce nitrosothiols which converts endogeneous or exogeneous nitrite/nitrate or nitrosothiols to NO when in contact with blood.” A general definition of “biomimetic” is imitating, copying or learning from nature or biological systems. The Applicants also teach that metal ion ligand complexes are suitable biomimetic catalytic agents. Combining the Applicants’ specification with the general knowledge of metal ions, one skilled in the art would be enabled to make or use the invention as defined in claim 6.

Claim 13 recites the use of “lipophilic salts of nitrite/nitrate or nitrosothiols within the polymer to create a reservoir of nitrite/nitrate or nitrosothiol that can continuously leak to the catalytic surface.” While claim 14 lists a specific example of such a salt, the specification as filed, at page 6, lines 2-7, lists further examples of such lipophilic salts. Still further, one skilled in the art would know that any nitrite salt performs the function described, which means the difference in the identity of the nitrite salt lies with the cation of the salt. Claim 13 recites that the identity of this cation is lipophilic. One skilled in the art would be able to look up in a chemical catalog or on an on-line search engine to find compounds that contain nitrite and have bulky or lipophilic cations that would function as the lipophilic salts as recited in claim 13.

As such, Applicants respectfully submit that the rejection of claims 6-8 and 13 under 35 U.S.C. 112, first paragraph is improperly placed, and respectfully request withdrawal of the same.

Claims 1-19 and 30-31 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. First, the Examiner states that bridging lines 2 and 3 of claim 1 and where recited in other claims “nitrite reductase-like activity” is uncertain as to meaning and scope.

Applicants respectfully point out that claims 1-5 have been cancelled. Amended claim 6 recites language regarding “nitrite reductase-like activity” that is rejected by the Examiner. Applicants respectfully submit that nitrite reductase (NiR) is a specific class

of enzymes, which enables the catalytic conversion of nitrite to nitric oxide. As NiR is a specific term, the term “nitrite reductase-like” is used to describe compounds that have the same function – enabling the conversion of catalytic nitrite to nitric oxide – but does not fall into the strict definitional category of NiR enzymes as defined by the scientific community. As such, Applicants respectfully submit that being “like” nitrite reductase is a very specific definition when used to describe function.

The Examiner asserts that the term “biocatalytic agent” is uncertain as to meaning and scope. The Examiner also asserts that it is unclear as to the type of activity possessed by “xanthine oxidase.”

Applicants respectfully point out that the terms “biocatalytic agent” and “xanthine oxidase” are no longer recited in the pending claims.

The Examiner rejects claim 6 stating that the term “biomimetic catalytic agent” is uncertain as to meaning and scope. He points out that the line of demarcation between biomimetic and non-biomimetic catalytic agents is uncertain.

Applicants define “biomimetic catalytic agent” in the specification as filed at page 3, lines 17-19, as “a species possessing nitrite reductase-like activity, or the ability to reduce nitrosothiols which converts endogenous or exogenous nitrite/nitrate or nitrosothiols to NO when in contact with blood.” A general definition of “biomimetic” is imitating, copying or learning from nature or biological systems. A biomimetic agent would be a synthetic agent that performed the same function as an agent in the human body or physiological system whereas a non-biomimetic catalytic agent may be catalytic, but does **not** mimic natural processes. As such, Applicants respectfully submit that the line of demarcation between biomimetic catalytic agents and non-biomimetic catalytic agents is not uncertain.

The Examiner states that the phrase “other nitrogen-containing blood species” in claim 7 is uncertain as to meaning and scope, and as to species within and not within this limitation.

Applicants have amended claim 7 such that the phrase “other nitrogen-containing blood species” is no longer recited.

The Examiner rejects claim 10 because the purpose of reciting “(graphite)” after “carbon” is uncertain. The Examiner states that if the carbon is intended to be graphite, then graphite should be recited.

Applicants have amended claim 10 to recite “graphite.”

The Examiner asserts that claims 13 and 19 are uncertain as to the salts required, as it is unclear how one would know when a salt is lipophilic and non-lipophilic. Further, the Examiner notes that the antecedent basis for “polymer matrix” is not clear.

First, Applicants submit that lipophilic salts are defined in the art as those that stay within the polymer phase to a greater extent than those that would leach out to the aqueous phase. For nitrite/nitrate examples, the cation would generally have a large octanol-water partition coefficient since the nitrite/nitrate would be converted to NO, and anions from the blood would be used to achieve neutrality in the polymer phase. The octanol-water partition coefficient is the ratio of the concentration of a chemical in octanol and in water at equilibrium and at a specified temperature. The octanol-water partition coefficient has been correlated to water solubility; and therefore, can be used as a measure to determine the lipophilicity of substances. The greater the octanol-water partition coefficient, the greater the likelihood the compound will remain in the polymer phase. As such, one skilled in the art would be able to determine which salts are “lipophilic.” Further, claims 13 and 19 have been amended to respectively recite “polymer” and “polymer film.”

The Examiner contends that claim 31 is confusing by being dependant on claim 32, and that there is no antecedent basis for “the medical device.”

Claim 31 has been amended to depend from claim 30, which recites a medical device.

As such, Applicants respectfully submit that the rejection of claims 6-19 and 30-31 under 35 U.S.C. 112, second paragraph, has been traversed and overcome.

Claims 1-5, 10-12, 15-19, 30 and 31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Sivan et al. (6,569,688) in view of Blake et al. (6,682,732) and Keyes (3,933,589), and if necessary, in further view of Tedeschi et al. (6,645,518). The Examiner notes that claims 6-9, 13 and 14 are free of the prior art.

Applicants have cancelled claims 1-5. Further, claim 6 has been rewritten to include the limitations of claim 1, and dependent claim 10 has been amended to depend from amended claim 6. Further, claim 30 has been amended to recite that the catalytic agent is a biomimetic catalytic agent, which is a synthetic agent as opposed to the natural enzymes taught by Sivan.

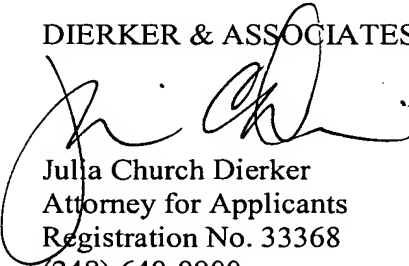
For all the reasons stated above, it is submitted that Applicants' invention as defined in claims 10-12, 15-19, and 30-31 is not anticipated, taught or rendered obvious by the cited references, either alone or in combination, and patentably defines over the art of record.

New claims 32-34 have been added to set forth additional specific embodiments of Applicants' invention. Support for the addition of claims 32-34 may be found in the specification as filed on page 3, lines 20-27 and page 4, lines 3-7.

In summary, claims 6-19 and 30-31 remain in the application, and new claims 32-34 have been added. It is submitted that, through this communication, Applicants' invention as set forth in these claims is now in a condition suitable for allowance. Further and favorable consideration is requested.

Respectfully submitted,

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